

Rejections Under 35 U.S.C. §§ 112, 102 and 103- Applicant hereby traverses the rejections and the stated grounds for rejection as expressed in the Office Action. Specifically and without limitation, Applicant denies that no description is present in the specification for those terms mentioned in the §112, first paragraph rejection of the Office Action; and Applicant denies that the terms objected to under §112, second paragraph in the Office Action are unclear; and Applicant denies that the claims rejected under §§ 102 or 103 are anticipated or rendered obvious by the art. Nonetheless, in an effort to place this case in condition for allowance, (i) Applicant has cancelled all claims which have been rejected under §§102 or 103, thus rendering the rejections moot, and (ii) Applicant has removed from allowable claims the language indicated as offensive in the Office Action. All cancellations of claims and all removal of limitations (amendments) are made with traversal and made without prejudice, and Applicant reserves its right to pursue and defend identical or similar claims and/or limitations in continuing cases.

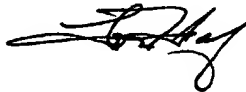
Allowable subject matter – Certain claims were indicated as being allowable, and Applicant appreciates such indication. In light of such allowances, certain of the allowable claims have been rewritten in independent form, and those with language expressed in the Office Action as being offensive under 35 USC §112 have been amended to remove the asserted offensive language. Specifically, claims 28/72, 37/73, 39/73, 28/77 83/82/81 and 85/84/81 have been rewritten as the new independent claims 89, 90, 91, 92, 93 and 94; and certain limitations from allowable claims have been presented in new dependent claims 95-97. It is Applicant's understanding, based on conversation with the Examiner Koczko, that the allowability of these claims rests in limitations separate from the offending §112 language, and therefore, the claims as amended are believed to be in condition for allowance. Due to redundancy, many of the claims indicated as being allowable have been canceled.

Information Disclosure Statement – The Information Disclosure Statement filed on October 28, 2002, was indicated as having not been considered, apparently because the materials were not in the English language. As the undersigned interprets the Office Action, only the reference, DE 43 08 354 A1 was not considered (since all others are initialed by the examiner). If this is not correct, Applicant requests clarification in order that all references might be considered.

Applicant submits herewith a new Information Disclosure Statement disclosing a new reference (which we have discovered to be an English language counterpart of the previously cited references. Applicant requests that this new reference be considered and signed off on by the Examiner.

Conclusion - In light of the above, the following claims remain pending and are submitted to be allowable: Independent claims 42, 74 and 89-94, and dependent claims 43-50, 52-57, 59, 60 and 95-97. Favorable consideration of this Amendment, and early issuance of a Notice of Allowance is courteously solicited.

Respectfully submitted,



Louis T. Isaf

c/o Womble Carlyle Sandridge & Rice
P.O. Box 720601
Atlanta, GA 30358-2601
(404) 962-7523
Docket Number: **E025 1031**



APPENDIX

This Appendix shows modifications made by the foregoing Response to the originally filed claims, with portions added shown underlined and portions deleted shown within brackets. With respect to originally dependent claims which have been rewritten in independent form: (i) portions which would represent their original independent form have been displayed without indication of added or deleted material; (ii) portions which have been added to or deleted from the original independent form of these claims are shown underlined and in brackets, respectively. New claims have been shown with a legend of “(New)”, but no underlining. Also, shown here are the non-amended claims still pending; and, thus, a complete set of claims now pending in the present case is presented in this amendment.

89. (Claim 28/72 Amended and Rewritten in Independent Form) A method for operating an internal combustion engine, the method comprising the steps of:
 - directing air through a first intake port to a cylinder during an intake stroke of a piston cooperating with the cylinder;
 - directing compressed air through a second intake port to the cylinder only during a compression stroke of the piston; [and
 - adjusting the air charge volumes within the cylinder, thereby providing a compression ratio lower than the expansion ratio of the engine;
 - further comprising the steps of:]
 - controlling the time of operation of a compressor generating the compressed air and the timing of intake valves cooperating with the first and the second intake ports; and,
 - controlling one or more air charge characteristics selected from the group consisting of turbulence, density, pressure, temperature, mean pressure and peak pressure.
90. (Claim 37/73 Amended and Rewritten in Independent Form) A method of operating an internal combustion engine, the method comprising the steps of:
 - introducing air through a first intake port into a cylinder during an intake stroke of a piston cooperating with the cylinder;
 - introducing compressed air through a second intake port into the cylinder during a compression stroke of the piston.; [and
 - adjusting the air charge volumes within the cylinder, thereby providing a compression ratio lower than the expansion ratio of the engine;
 - further comprising the steps of:]

Q

controlling the time of operation of a compressor generating the compressed air and the timing of the first and the second intake valves; and,
controlling one or more air charge characteristics selected from the group consisting of turbulence, density, pressure, temperature, mean pressure and peak pressure.

91. (Claim 39/73 Amended and Rewritten in Independent Form) A method of operating an internal combustion engine, the method comprising the steps of:
introducing air through a first intake port into a cylinder during an intake stroke of a piston cooperating with the cylinder;
introducing compressed air through a second intake port into the cylinder during a compression stroke of the piston.; [and
adjusting the air charge volumes within the cylinder, thereby providing a compression ratio lower than the expansion ratio of the engine;
further comprising the steps of:]
controlling the time of operation of a compressor generating the compressed air and the timing of the first and the second intake valves; and,
controlling one or more air charge characteristics selected from the group consisting of turbulence, density, pressure, temperature, mean pressure and peak pressure.
92. (Claim 28/77 Rewritten in Independent Form) A method of operating an internal combustion engine, the method comprising the steps of:
directing air through a first intake port into a cylinder during an intake stroke of a piston cooperating with the cylinder; [and,]
increasing the air charge density and turbulence in the engine, including the step of directing compressed air through a second intake port into the cylinder during a compression stroke of the piston;
[further comprising the steps of:]
controlling the time of operation of a compressor generating the compressed air and the timing of intake valves cooperating with the first and the second intake ports; and,
controlling one or more air charge characteristics selected from the group consisting of turbulence, density, pressure, temperature, mean pressure and peak pressure.
93. (Claim 83/82/81 Amended and Rewritten in Independent Form) A method of operating an internal combustion engine having a crankshaft driven by at least one piston moving through a plurality of power cycles, each power cycle involving at least a compression stroke and an expansion stroke aided by combustion taking place within a cylinder, wherein the compression stroke results in compressing of air and fuel within the cylinder, said method comprising the steps of
introducing during each power cycle air through a first port into a cylinder; [and]

introducing during each power cycle a compressed air charge through a second port into the cylinder[, including the step of introducing the compressed air charge into a cylinder which has a substandard compression ratio];
wherein a first intake valve cooperates with the first port and a second intake valve cooperates with the second port, the second intake valve occupying an open position only while the first intake valve occupies a closed position;
[further comprising the steps of:]
controlling the time of operation of a compressor generating the compressed air and the timing of the first and the second intake valves; and,
controlling one or more air charge characteristics selected from the group consisting of turbulence, density, pressure, temperature, mean pressure and peak pressure.

94. (Claim 85/84/81 Amended and Rewritten in Independent Form) A method of operating an internal combustion engine having a crankshaft driven by at least one piston moving through a plurality of power cycles, each power cycle involving at least a compression stroke and an expansion stroke aided by combustion taking place within a cylinder, wherein the compression stroke results in compressing of air and fuel within the cylinder, said method comprising the steps of
introducing during each power cycle air through a first port into a cylinder; [and]
introducing during each power cycle a compressed air charge through a second port into the cylinder[, including the step of introducing the compressed air charge into a cylinder which has a substandard compression ratio];
wherein a first intake valve cooperates with the first port and a second intake valve cooperates with the second port, the second intake valve occupying an open position only during the compression stroke;
[further comprising the steps of:]
controlling the time of operation of a compressor generating the compressed air and the timing of the first and the second intake valves; and,
controlling one or more air charge characteristics selected from the group consisting of turbulence, density, pressure, temperature, mean pressure and peak pressure.
95. (New) The method of claim 89, 90, 91, 92, 93 or 94, comprising the step of producing a super-charged air density and increasing turbulence in a low compression engine.
96. (New) The method of claim 89, 90, 91, 92, 93 or 94, wherein compressed air is introduced through a second port into the cylinder after compression has begun.

97. (New) The method of claim 93 or 94, wherein the step of introducing during each power cycle a compressed air charge through a second port into the cylinder, includes the step of varying the compressed air charge introduced in one cycle of the plurality of power cycles from the compressed air charge introduced during another of the cycles of the plurality of power cycles.

THE FOLLOWING CLAIMS ARE UNCHANGED BY THIS AMENDMENT

42. A method of operating an internal combustion engine, the method comprising the steps of:
- lightly compressing a low pressure air charge outside a cylinder;
 - directing the low pressure air charge through a first intake port into a cylinder cooperating with a piston, during an intake stroke of the piston;
 - compressing a high pressure air charge outside of the cylinder; and,
 - directing the high pressure air charge through a second intake port into the cylinder, during a compression stroke of the piston.
43. The method of claim 42, wherein the low pressure air charge is at a first pressure and the high pressure air charge is at a second pressure, the second pressure being greater than the first pressure.
44. The method of claim 42, wherein the low pressure air charge is compressed by a first compressor and the high pressure air charge is compressed by a second compressor.
45. The method of claim 42, wherein a first intake valve selectively occludes the first intake port and a second intake valve selectively occludes the second intake port, the second intake valve occupying an open position only while the first intake valve occupies a closed position.
46. The method of claim 45, further comprising the steps of:
- controlling operation of a compressor generating the high pressure air charge and the first and the second intake valves; and,
 - controlling one or more air charge characteristics selected from the group consisting of turbulence, density, pressure, temperature, mean pressure and peak pressure.
47. The method of claim 42, wherein a first intake valve cooperates with the first intake port and a second intake valve cooperates with the second intake port, the second intake valve occupying an open position only during the compression stroke.
48. The method of claim 47, further comprising the steps of:
- controlling operation of a compressor generating the high pressure air charge and the first and the second intake valves; and,
 - controlling one or more air charge characteristics selected from the group consisting of turbulence, density, pressure, temperature, mean pressure and peak pressure.

49. The method of claim 42, further comprising the step of:
cooling the low pressure air charge prior to entry thereof into the cylinder.
50. The method of claim 42, further comprising the step of:
cooling the high pressure air charge prior to entry thereof into the cylinder.
52. The method of claim 74, wherein the primary air charge is at a first pressure and the secondary air charge is at a second pressure, the second pressure being greater than the first pressure.
53. The method of claim 74, wherein the directing of the primary air charge into the cylinder is completed before the introducing of the secondary air charge into the cylinder.
54. The method of claim 74, wherein a first intake valve selectively occludes the first intake port and a second intake valve selectively occludes the second intake port, the first intake valve occupying an open position only while the second intake valve occupies a closed position.
55. The method of claim 54, further comprising the steps of:
controlling operation of a compressor generating the secondary air charge and the first and the second intake valves; and,
controlling one or more air charge characteristics selected from the group consisting of turbulence, density, pressure, temperature, mean pressure and peak pressure.
56. The method of claim 74, wherein a first intake valve cooperates with the first intake port and a second intake valve cooperates with the second intake port, the second intake valve occupying an open position only during the compression stroke.
57. The method of claim 56, further comprising the steps of:
controlling operation of a compressor generating the secondary air charge and the first and the second intake valves; and,
controlling one or more air charge characteristics selected from the group consisting of turbulence, density, pressure, temperature, mean pressure and peak pressure.
59. The method of claim 74, further comprising the step of:
cooling the primary air charge prior to entry thereof into the cylinder.
60. The method of claim 74, further comprising the step of:
cooling the secondary air charge prior to entry thereof into the cylinder.

74. A method for operating an internal combustion engine, the method comprising the steps of:

- directing a primary air charge through a first inlet port into a cylinder;
- compressing a secondary air charge outside of the cylinder;
- introducing the secondary air charge through a second inlet port of the cylinder,
after compression has begun within the cylinder; and
- lightly compressing the primary air charge prior to directing thereof into the cylinder.